Volunteer Firemen

Professional Journal of the Volunteer Firemen's Section of the National Fire Protection Association

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Volume 4, Number 8 **BOSTON, MASSACHUSETTS** **August, 1937**

Clifford G. Scofield

If it were always possible to place 16 men on every wooden shingle roof exposed to flying brands, wooden roofs might not be the leading cause of conflagrations! Fire retardant roofing eliminates this needless cause of fire loss.

When It Rains Fire!

Roofs Must Be Fire Retardant as Well as Watertight — Combustible Wooden Shingle Roofs Cause Most Conflagrations in City and Country

WE PRESENT the above picture as typical of the great battle waged every day in cities and towns throughout the United States and Canada against the greatest cause of sweeping conflagrations—the wooden shingle roof. While this Vermont bucket brigade was able to save the farmhouse by literally covering the roof with bucketfuls of water and wet potato sacks, all too often fires spread from building to building by means of wooden shingle roofs. Firemen are prepared to fight one fire at a time but no fire department is powerful enough to battle the 10 to 100 simultaneous fires which frequently result when wooden shingle roofs are exposed to a shower of sparks.

In an N.F.P.A. survey of 100 conflagrations since 1900, it was found that 55 of them were primarily due to wooden shingle roofs which spread the fire ahead of the fire fighters. Not only are wooden shingles the leading cause of conflagrations but in many communities they are the leading cause of fires. For example in Detroit, Mich., and Minneapolis, Minn., they cause 40 per cent of all building fires.

If a man put a roof on his house that did not resist water he would be considered crazy. It is however equally important that a roof be designed to resist chimney sparks and flying brands from fires. A wooden shingle roof always invites destruction by fire. For this reason many cities and towns prohibit wooden shingle roofs.

Air Conditioning Systems

Fire and Smoke May Be Blown Through Buildings—Hidden Ducts That Cannot Be Reached Should Not Be of Material That Burns

By Robert S. Moulton
Technical Secretary

IN THE good old days of steam fire engines buildings were chiefly designed for outward show with elaborate brickwork and imposing turrets. Inside, however, they were a dread to the most fearless fire fighter. A great open stair and light shaft ascending to the roof in the center of the building was a common feature. Open floor and wall spaces without fire stopping allowed a fire to spread unseen throughout the combustible interior in a very few moments. Unless a fire was caught in the chemical line stage, total losses could be expected.

Gradually, through the years, these architectural monstrosities have burned down. They have been replaced, at the insistence of fire protection authorities, with improved buildings having enclosed stair and elevator shafts, firewalls and fire stopping. Just as firemen are congratulating themselves on reduced fire loss figures, which are possible because fires are now usually confined to one room, into the picture has come the new comfort-giving invention, air conditioning. The short time that this innovation has been used has been sufficient to prove that unless these systems are properly installed and safeguarded, modern buildings may revert to the old fashioned types of "fire traps". Air conditioning ducts running through concealed spaces and passing fire walls may readily serve to spread a fire. The intensity of such a fire may be accentuated by blower fans and the escape of refrigerating gases used in connection with the cooling system is an additional fire and life hazard. These gases may be flammable or poisonous or both.

Fortunately the hazards arising from air conditioning systems may be safeguarded without undue hardship or expense if installations conform to the good practice regulations prepared by the N.F.P.A. These regulations are based on actual experience with air conditioning system fires.

Firemen are not only concerned with the fire hazards of air conditioning systems, but with the possible panic and life hazards as well. While no fatalities have as yet been reported from this cause a fire which occurred in a theatre at Maywood, Illinois, shows one source of possible danger. The fire started in a dressing room on the stage. The blower fans were not shut down for 5 to 10 minutes after the fire department arrived. The continued operation of the air conditioning system fanned the fire to greater intensity, particularly in the balcony which was made inaccessible by smoke. Although the building was of fire resistive construction the loss was considerable. Fortunately few persons were in the building when the fire started. It takes little imagination to picture what the result might be in a crowded theatre should the blower fans force smoke from a fire into the auditorium.

Ruins of the Western High School in Detroit after a 5-alarm fire. Ventilating ducts which honeycombed the building spread the fire to all parts of the structure.

A NUMBER of serious fires have also resulted from the use of combustible linings for air conditioning ducts. One of the most serious of these occurred in a New York City theatre. Although this building was of fire resistive construction a two alarm fire caused $65,000 loss. A rubbish fire in a courtyard ignited the combustible lining of an air conditioning duct which extended along the outside of the building. Smoke and fire were discharged into the auditorium through numerous duct openings, igniting the balcony seats and furnishings. Fortunately the blower fans were not operating when the fire occurred and the audience was small, but two motion picture machine operators were nearly trapped in their booth. One of the most important regulations for the safeguarding of air conditioning systems is that no combustible material shall be used for the insulation of air ducts.

Another serious fire occurred in a 10 story office building in Los Angeles. The attic space contained air conditioning ducts lined with a wood fibre. This duct lining was not readily combustible but would tend to smoulder. When the blower fans of the system were turned on in the morning a smouldering fire of unknown origin was fanned into flames which were carried by the system to other sections of the building and a $50,000 loss resulted. This fire illustrates another objection to combustible duct linings. The ducts are almost

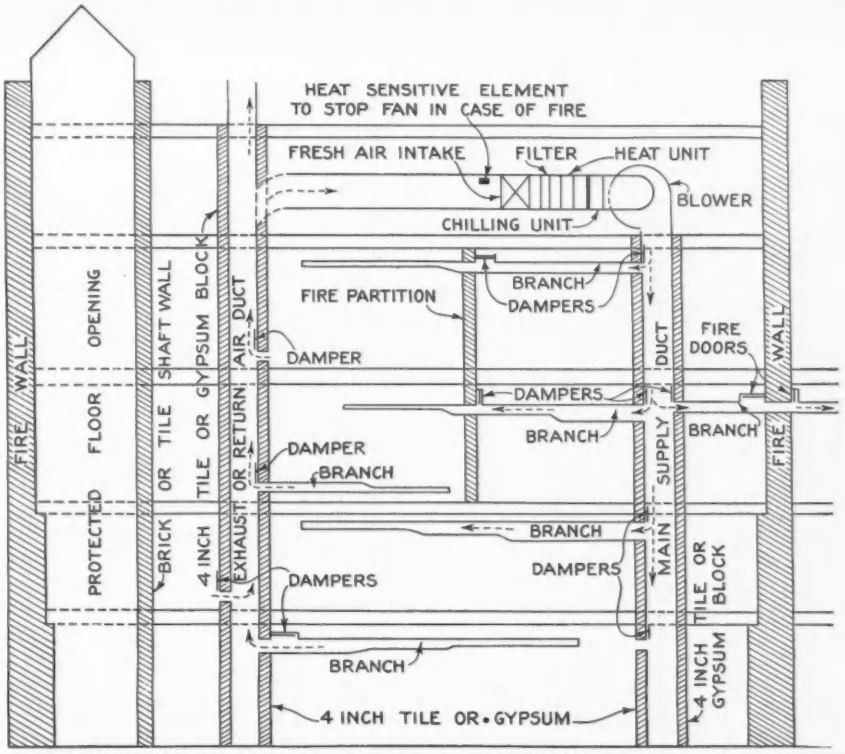
always located in concealed wall spaces and other locations which are inaccessible to firemen.

That the prohibition of combustible duct linings is important even in dwellings is shown by a fire which occurred in a $200,000 mansion nearing completion in Washington, D. C. A fire of unknown origin started on the second floor and spread to the third and fourth floors and roof space by means of air ducts. These ducts were insulated with cork which was covered with a flammable paint. A loss of $20,000 resulted before firemen responding to two alarms could check the fire.

FIREMEN know that refrigeration plant fires are a problem in themselves, so they can appreciate the possibilities of trouble when a fire in an air conditioning system melts connections in the refrigerating equipment of the system and lets the gas escape. N.F.P.A. rules specify that where refrigeration gases are explosive or toxic that coils must not go through air conditioning ducts.

A fire in a Rochester, N. Y., newspaper plant serves to show the possibility of fires starting in oil soaked filters used in cleaning and filtering the air which is circulated. The fire originated from a spark from a cigarette or blower fan which ignited dust in the foul air intake from the workrooms. Burning particles were blown through the duct system until they lodged upon the air filter of steel wool saturated with oil which ignited. The fire damaged the coils of the refrigerating unit and allowed the refrigerant, which fortunately was non-flammable, to escape. Smoke was discharged through the air ducts into the workrooms but the system was quickly shut down and the fire loss was confined to $1,000 damage to the air conditioning equipment. A slow burning type of filter or one sprinkler head would help control this hazard.

One fire protection rule of importance is that an attic may not be used as a part of the duct system unless it in all ways equals approved duct construction. Persons familiar with the old hot air heating and ventilating systems common in school buildings will appreciate the need of this rule. Where an open attic space is part of a ventilating or air conditioning system a fire starting in any portion of the building usually spreads up the ducts into the attic space. From this inaccessible point it generally destroys the roof of the building and brands drop down other ducts starting fires in other portions of the building.



Typical installation of an air conditioning system in a building of fire resistive or heavy timber construction. The manner in which ducts pass through floors and partitions making necessary proper dampers and fire doors is shown.

WHILE air conditioning systems normally carry cool air in the summer, it should be remembered that in winter many of these systems are utilized as hot air heating ducts and should be constructed accordingly. Regardless of the type of construction it is essential to protect combustible woodwork so as to confine a possible fire to the duct.

Where air conditioning ducts pass from floor to floor they must be considered as vertical openings which may possibly carry fire. At all such locations as well as where they pass through fire partitions, ducts must be protected by approved automatic dampers operated by a fusible link or other approved heat actuated device. Where air conditioning system ducts pass through a fire wall it is as important that they be protected with automatic fire doors as other fire wall openings. Special fire doors which drop into place blocking the duct are designed for this purpose. Outside air intake openings also require approved automatic fire doors or shutters.

In fire resistive or other buildings having protected vertical openings air conditioning system ducts must be treated much like chimneys and flues. In such buildings air conditioning system ducts should be enclosed with 4-inch hollow tile or gypsum block to prevent the spread of a fire from floor to floor. In buildings of inferior construction having numerous other vertical openings the expense of such duct enclosure might not be justified.

One other cause of air conditioning system fires is defective wiring and electrical equipment. All such equipment should be installed in conformance with the National Electrical Code.

The complete 1937 N.F.P.A. regulations for the safe installation of Air Conditioning will be sent to any reader of VOLUNTEER FIREMEN on request.

California's Rural Fire Protection

200 Rural Fire Trucks and County Organization Are Giving Protection Where Bad Fire Record Made Insurance Almost Impossible 10 Years Ago

DURING the summer of 1928, a fire travelled 25 miles through growing grain on a front 6 to 12 miles wide across the California countryside. This was typical of a number of such fires that year. The fire experience was so bad that farmers faced difficulty in obtaining fire insurance on their grain. In this grave situation the Governor of the State appointed a committee from his council to see what could be done. The result was the development of organized rural fire protection which now covers over one-third of the State according to Loren S. Bush, Chief Engineer, Board of Fire Underwriters of the Pacific, whose office was called upon to assist in this work.

There are now more than 200 rural fire trucks in operation in California. Eleven counties are wholly protected and 25 others have partial protection. This protection has made it possible for farmers not only to obtain insurance on both grain and buildings but to do so at reduced rates. In a typical county the insurance loss ratio dropped from 107 to 24 per cent the first year after protection began to operate.

A major factor in extending rural protection has been cooperative agreements between the State Division of Forestry and the county governments. For a specified sum the State agrees to protect all property within the county. The entire plan of maintenance for rural protection is based upon state laws which provide for the organization of fire districts under the supervision of the county. Financial support is provided by a tax levied against all assessable property in the district. Wherever possible a city or town fire department is used to form the nucleus for the rural protection.

BRADLEY, GEO. Dist. SALINAS OUTSIDE
Ranch No. 43

1. Name of ranch and owner ... GEO. BRADLEY
2. Telephone number ... 2205-J
3. Location and district ... ½ MILE SOUTH OF SALINAS ON 101 HIGHWAY
4. Number of buildings ... TWELVE
5. Water supply:
Wells 2
Tanks 1
Power supply ELECTRIC & WINDMILL
Pump gallons 500
Fire engine 2½" connection on pump YES
Reservoir gallons
Tank gallons 6,000
Height of tank 25 FT.
Manhole in tank roof YES
Greatest distance building from water supply 450 FT.
Shortest distance building from water supply 15 FT. MEN HOUSE
Neighbor's water supply-tank, gallons ... pump gallons
Distance from neighbor's water supply

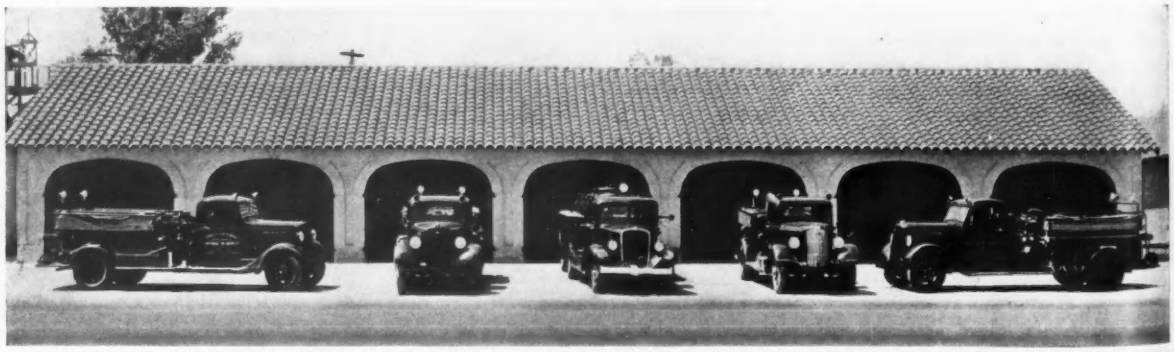
Remarks: JUST OFF HIGHWAY. BUILDINGS ALL FRAME, GOOD CONDITION, CLOSELY GROUPED. JAP CAMP IN BACK OF BUILDINGS.

Sketch water supplies and roads leading from buildings to same. Use back of sheet.

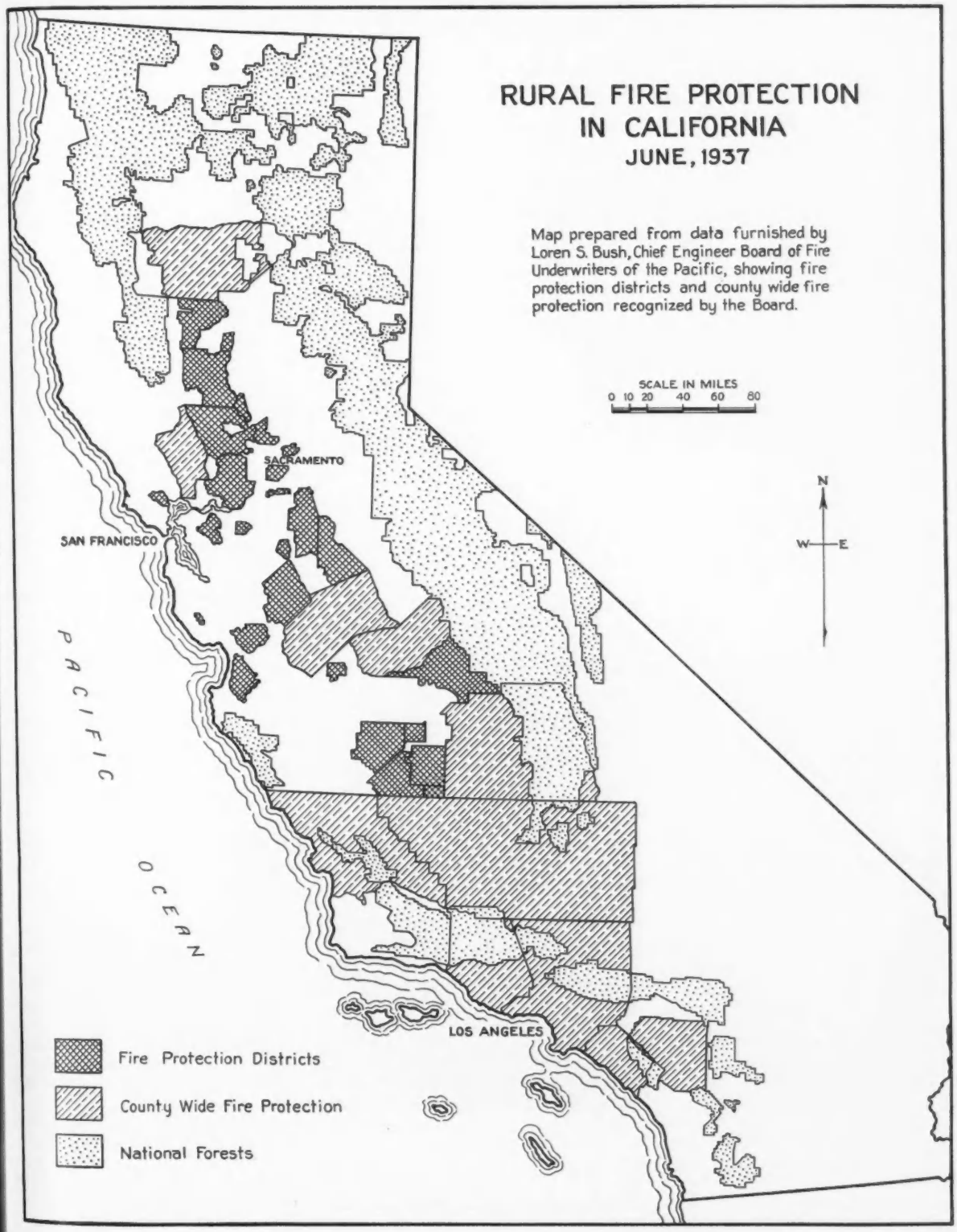
Remarks: WATER TANK LOCATED 30 FEET CLOSE TO HIGHWAY SOUTH SIDE. FENCE 15 FT. OUT FROM TANK FRAME. GOOD DRIVEWAY TO FENCE. DEEP WELL PUMP LOCATED BY HIGHWAY ON SOUTH SIDE OF BUILDINGS. EASY TO GET TO. DRAFT FROM LARGE WOODEN FLUME IN GATEWAY. VERY CONVENIENT. PUMP 15 FT. FROM FLUME. STANDARD FIRE CONNECTION 15 FT. FROM ROAD ON MAIN DRIVEWAY. DRAFT DIRECT FROM PUMP.

Assisting the Governor's Council and the Board of Fire Underwriters of the Pacific in the first attack on the problem were the College of Agriculture, the State Forester and other officials. This was the beginning of the California Rural Fire Institute which draws up suggestions for the organization of rural fire departments and equipment of rural fire trucks. Three types of equipment are suggested for differing conditions. Where the principal values are in buildings, a large truck carrying at least 300 gallons of water, a supply of 2½-inch hose, and a pump of approximately 500 gallons per minute is recommended. Where grain is the principal item to be protected, the requirements call for a smaller truck carrying 250 gallons of water and a pump of 100 gallons per minute capacity. In mountainous country, where mobility is of prime importance, a small truck carrying 150 gallons of water and a pump of 30 gallons per minute capacity is suggested.

The need of water for fighting structural fires has led to the development of local facilities including connections to domestic supplies, the building of water holes and places for drafting from irrigation supplies. Some rural fire departments have a card index of every farm showing the route to the property as well as buildings and water supplies.



The above card shows firemen the route to each farm, location of buildings and water supplies. The modern rural department below is in strong contrast to the trailer equipped with water barrels and hand pumps, used in rural California 10 years ago.


RURAL FIRE PROTECTION
IN CALIFORNIA
JUNE, 1937
Map prepared from data furnished by Loren S. Bush, Chief Engineer Board of Fire Underwriters of the Pacific, showing fire protection districts and county wide fire protection recognized by the Board.
SCALE IN MILES
0 10 20 40 60 80
N
W E
SACRAMENTO
SAN FRANCISCO
PACIFIC OCEAN
LOS ANGELES
Fire Protection Districts
County Wide Fire Protection
National Forests

Doors That Shut Out a Fire

Openings in Fire Walls Left for Passage of Persons or Goods Will Permit Passage of Fire Unless Fire Doors are Provided

WHEN a business man builds a building he is generally interested in convenience. He wants to provide for the easy movement of both persons and goods from section to section and from floor to floor. Left to his own ideas his business building would have enough floor and wall openings to make the structure resemble a large rabbit warren. Such a building doesn't appeal to a fire fighter. He knows that a fire would quickly take advantage of open doorways and shafts and rapidly spread from one section to another. A fundamental principle of fire protection is that large areas be subdivided by fire walls so as to confine a fire to the section where it originates. Firemen can advance their lines behind a fire wall with reasonable safety and attack the fire at close range. However, where practical considerations make openings through fire walls necessary, the openings may be protected with approved types of fire doors.

All fire doors are not designed to withstand the same degree of fire exposure. Doors protecting openings in fire walls must be heavier and more substantial than fire doors at stair and elevator shaft openings. This is because fire doors at both sides of a fire wall opening are fairly close together with but a small insulating air space between. Even a moderate amount of fire passing a fire wall opening might spread the fire to an adjoining building or section. At stair or elevator shafts, however, if flames did pass the fire door at one level they would lose much of their intensity before they reached the floor above and attacked the fire door at that level. The air in the stair or elevator shaft acts as an insulation between the fire doors at the various floor levels. For openings in office and corridor partitions even lighter weight fire doors are permitted. This is because in smaller areas the fire is not likely to be as intense as when an entire floor or building is involved.

STANDARD fire door protection for a fire wall opening consists of a fire door on each side of the wall. Double fire doors not only provide added insulation against heat but provide an added time factor so important in fire fighting. A severe fire might pass by one fire door but would not be likely to pass the second door. In addition to the time element, double fire doors are of importance in serious fires where falling timber or other débris may sufficiently damage the door on the fire side to allow the fire to pass through. It might also happen that a fire door on one side of the wall would be blocked open due to careless piling of goods and the second door gives double security. In a few locations, however, such as in fire resistive buildings where the fire hazards are primarily from combustible contents and where good protection is available single fire doors may give reasonable protection.

Many small details in the construction of fire doors are of considerable importance. Fire doors must not only be able to withstand severe heat but must be able to withstand the effects of hose streams upon them while they are hot. Fire doors suitable for fire wall openings may be of several types of construction. The principal types are:

(a) 3-ply wooden core tin-clad doors.
(b) Sheet metal doors.
(c) Steel rolling doors.
(d) Hollow metal doors.

A tin clad fire door which prevented the spread of a garage fire into an adjoining section valued at $200,000. After the fire was out firemen opened the tin covering to put out the smouldering wooden core. Doors of this type have high heat insulating value.

EACH type of fire door has certain advantages and disadvantages. For example, a rolling steel fire door fits tightly and is excellent for keeping out fire or smoke but is not as good as other types in keeping out radiated heat. Tin clad fire doors, however, have high heat insulating value but permit the passage of some smoke.

The heat of a fire may pass a fire door either by radiation or by the passage of flame around the doors. Wood, although a combustible material, has good insulating value and is often used as the core of a metal clad fire door. When fire doors are constructed with wooden cores it is necessary that a small portion of the wood on the exposed side be left uncovered by the sheet metal coating to provide a vent for the smoke given off by the heated wooden core during a fire. When such a vent area has not been provided smoke explosions have occurred under the metal covering of the door, frequently blowing off the protecting sheet metal and allowing the wooden core of the door to burn.

Fire doors which are substandard in design, construction, or hardware may not give the results expected during a severe fire. Details such as chafing strips and the proper lock jointing of tin on the outside of tin-clad fire doors are important. The one way to make sure that fire doors will do what is expected of them is to choose doors which carry the label of Underwriters' Laboratories, Inc. This label shows that the fire doors in question are of good construction and are well designed to withstand a serious fire. More than that it indicates that doors of that type have successfully passed through the intense fires in the test furnace at the Laboratories' Chicago headquarters.

Fire doors to be properly installed must be securely hung so that they will remain in place throughout the most severe fire. The doorway where the door is installed must have a substantial sill of fire resistive construction. The sill must prevent the passage of flames under the door and also help support the door during a serious fire.

In making inspections see that the doors and their hardware, including fusible links, are in good condition. The action of automatic sliding doors may be tested by raising the counterweight by hand. Guides for rolling steel doors should also be checked as these guides sometimes become so badly damaged by trucks or merchandise striking them that the door cannot drop the entire distance to the floor. Any paint on the fusible links should also be scraped off.

One of the most frequent causes of fires getting through openings protected by fire doors is that doors are carelessly blocked open by the storage of merchandise. Self-closing swinging doors at exits are sometimes found hooked open for the convenience of the occupants. This makes the doors useless.

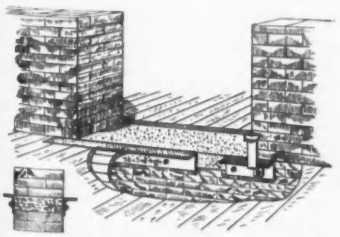
When inspecting fire doors it is also important to note any openings in fire walls which are not properly protected. Unless all openings are protected fire may spread making the fire door equipment useless. In addition to fire doors for fire walls, stair and elevator shafts, partitions and window openings should be protected in a standard manner with equipment designed for the particular type of exposure. Exposed windows should be equipped with fire shutters, wired glass windows or open sprinklers.

In choosing the types of fire doors to be installed at any location consideration must be given to the advantages and disadvantages of various types of doors. For example doors installed at exits should not be of a type which when closed would be difficult to reopen. Fire doors for exits should be of self-closing swinging types which close each time they are open rather than automatic doors which are normally kept open and are automatically closed when fire operates fusible links or thermostats. While self-closing doors are preferable for exits they have the disadvantage of requiring more space than automatic doors of the sliding, or rolling types and may be blocked open making the doors useless. For these reasons horizontal doors are preferable for most industrial locations.

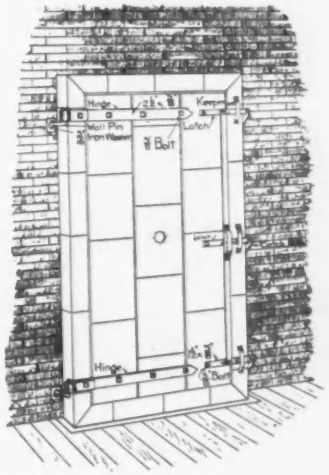
In attacking a fire behind a fire door it is considered good fire department practice never to open a fire door unless two charged lines are in position at the opening. This is because it is very important not to take any chances that would allow a fire to spread past a fire wall into another building. Dependence cannot be placed upon a single stream which might fail at the crucial moment and when a fire is very intense it is likely to keep two streams busy to prevent its passage. Fire doors should not be opened during a fire any more than is necessary to attack the blaze.

Radium

Firemen with a monitor nozzle and hand lines are shown in an unsuccessful attempt to halt the spread of a fire through unprotected fire wall openings between two department store buildings in Muskegon, Michigan, early on the morning of February 6, 1937. A loss of $400,000 resulted because a year ago store managers found fire walls a slight inconvenience to trade between the two buildings and had unprotected openings cut through them. The fire caused complete interruption of business for the concerns which could not stand the slight "inconvenience" of fire walls and did not bother to protect the openings which were made.



An important feature of protected fire wall openings is a substantial sill of incombustible construction which will help support the fire door and prevent the passage of fire below the door. The sill shown is of concrete with angle iron edges.



A typical swinging tin clad fire door installation. Note how this door latches at three points to prevent warping by intense heat which would permit the spread of fire.

Problem Questions
FOR AUGUST

Suggested for discussion at company and department meetings this month

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What are some advantages of fire prevention education in schools and what part can firemen take in such a program?

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Under what circumstances may fires go out of themselves?

Watch for the answers
in the next issue of
VOLUNTEER FIREMEN

Portable Drill Tower for Firemen's Tourneys

THE West Bend, Wisconsin, Fire Department, (Member N.F.P.A.) has a drill tower which has the novel feature of being portable, according to Chief George H. Kuehlthau. When the West Bend firemen go to one of the drill contests frequently held in their region they say, "You supply the eats and we'll supply the drill tower." This is an easy matter for them because of the simple design of the tower which can be quickly taken apart and loaded on a truck. All of the 4 by 4 inch corner posts and the 2 by 4 inch braces are drilled uniformly so that anyone can readily bolt them together.

This drill tower of the West Bend, Wisconsin, Fire Department (Member N.F.P.A.) may be readily taken apart and moved to another location. It is designed for use in firemen's tournaments. The total cost of this tower was only $233.

The tower, which is three stories or approximately 35 feet high, has the most essential features of larger drill towers. The front has a framing with window openings for ladder work. Inside is a stairway up which hose lines may be taken. The ground floor is enclosed to form a smoke room for gas mask drill. Anchorage for the tower is obtained by the simple expedient of extending the heavy base timbers out a few feet in each direction from the base of the tower.

Not the least attractive feature of this tower is its low cost, which including both labor and materials amounted to only $223.44. This is itemized as: lumber, $96.58; carpenter, $70; steel, $18; labor on steel work, $20; bolts, $18.86.

△ △ △ △ △

Discussion Subjects

65

Q. What problems do air conditioning systems present to firemen?

A. Air conditioning systems may serve to carry smoke and fire throughout a building. If hidden air ducts have combustible linings the fire may be very difficult to locate and attack. Oil filters used to clean the air and refrigerating equipment used to cool the air present additional hazards. Blowers used to distribute air through the ducts may continue to fan a fire and should have heat actuated automatic shutoffs and a remote control switch. Air conditioning systems may be made reasonably safe by following N.F.P.A. good practice regulations. On page 2 is a complete discussion of the problems of air conditioning systems, by Robert S. Moulton, N.F.P.A. Technical Secretary.

66

Q. How should doorways in division walls be protected to prevent the spread of fire?

A. All doorways in division walls should be protected by standard fire doors approved for that purpose. Fire doors should be installed on both sides of a division wall to provide double security and guard against the fire passing a single door. Fire doors are of different types. Each have certain advantages for differing situations. For a full consideration of fire doors see page 6.

NEW CATALOGUES

This department is for the convenience of readers who wish to be advised of new products or services in the fire field. When writing for catalogues please mention VOLUNTEER FIREMEN.

American Steam Pump Co., Battle Creek, Mich. Bulletin No. 75 (Edition No. 4). Data on Barton pumps and fire streams.

Barber-Colman Company of Massachusetts, Framingham, Mass. A 30-page catalogue oh overhead doors for garages, fire stations, and other buildings. (Manual and electrical operation).

Burroughs Wellcome and Company, 9-11 East 41st Street, New York, N. Y. "First-Aid for Comfort and Safety," 56 pages. A manual on how to render first-aid in emergencies, how to make bandages, and a catalogue of supplies.

W. S. Darley and Co., 2810 Washington Blvd., Chicago, Ill. Literature illustrating and describing a complete line of fire apparatus and pumps.

Federal Electric Co., 8717 South State St., Chicago, Ill. Bulletins Nos. 55 and 56. Complete details of Federal sirens.

The Fyr-Fyter Co., Dayton, Ohio. Four-page illustrated leaflet describing 5-gallon farm fire extinguisher (new shape hand pump type with anti-freeze charge. Approved by Underwriters' Laboratories, Inc.)

Gamewell Co., Newton Upper Falls, Mass. "Vitaguard," a manual, 40 pages. A complete description of the Vitaguard fire alarm system for volunteer fire departments and industrial plants.

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa. Four-page bulletin describing MSA All-Service Gas Mask (Burrell Type).

Overhead Door Corporation, Hartford City, Ind. "Overhead Door," 24-page catalogue on overhead doors for garages, fire stations, and other buildings. (Manual and electrical operation).

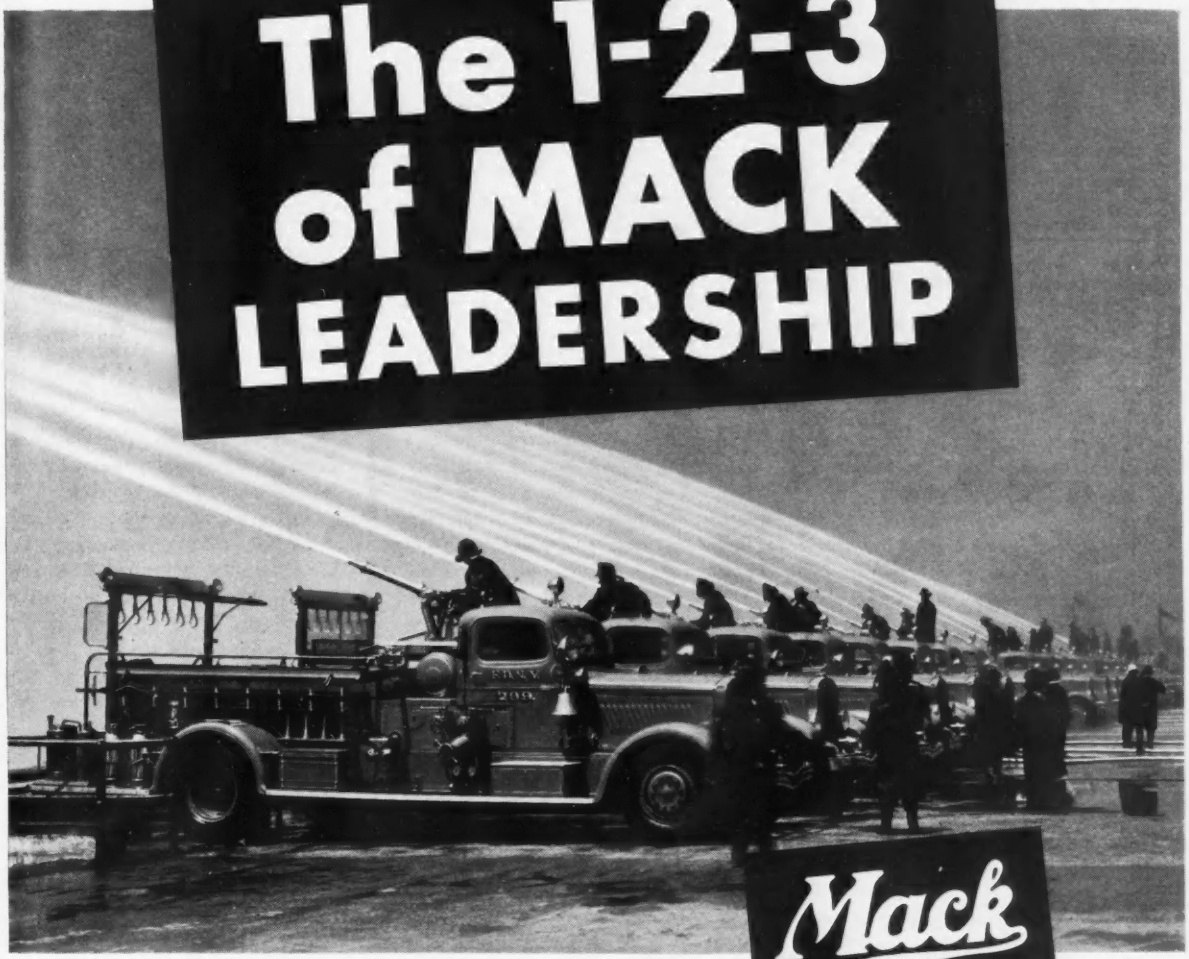
Protectoseal Company, 1906 South Western Ave., Chicago, Ill. "Safety Devices for Hazardous Liquids," Catalog D, 68 pages. Safety cans, tank vents, and other devices for safeguarding flammable liquids.

Quaker City Rubber Company, Frankford P. O., Philadelphia, Pa. "Quaker Fire Hose," 20-page booklet giving partial list of cities and towns that have purchased this brand of hose.

Robbins Lightning Protection Company, Maryville, Mo. "Flame System of Lightning Protection," 16 pages.

Walter Kidde & Company, 140 Cedar St., New York City. Treatise on the chemical aspects and physical characteristics of fire with emphasis on proper protection against all fires, 15 pages.

The 1-2-3 of MACK LEADERSHIP



Mack

New York's 19 new Mack pumpers in action during a recent exhibition by the New York Fire Department.

Three unique advantages have kept Mack out in front in modern fire engineering

1. Mack's vast resources—which permit constant improvement. Most of the outstanding developments in fire apparatus of recent years have been pioneered by Mack.

2. Extensive facilities for research and engineering progress—and thoroughgoing outright manufacture. Every part of a Mack fire engine is carefully designed and built to Mack's rigid standards.

3. Country-wide experience, built up through 37 years of manufacturing commercial vehicles of all types. And today Mack fire apparatus leads the field in money-saving stamina, dependability and top-notch efficiency on the job.

MACK TRUCKS, INC. • FIRE ENGINE DIVISION • NEW YORK, N. Y.

Volunteer Firemen

Professional Journal of the Volunteer Firemen's Section of the National Fire Protection Association

Published by the National Fire Protection Association, a voluntary non-profit organization, 60 Batterymarch Street, Boston, Massachusetts, U.S.A. Franklin H. Wentworth, Managing Director. Percy Bugbee, Assistant Managing Director. Horatio Bond, Managing Editor.

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Get Your Money's Worth From the N.F.P.A.! Volunteer firemen members of the National Fire Protection Association should not consider their membership a mere routine detail in subscribing to the magazine VOLUNTEER FIREMEN. Instead they should realize that they are associated with the leading fire chiefs, fire marshals and fire protection engineers of the United States and Canada who hold N.F.P.A. membership one of the privileges of their profession. In setting up the subscription plan of VOLUNTEER FIREMEN the N.F.P.A. Directors might have authorized individual subscriptions similar to those of other magazines. Such a plan, however, would not have enabled volunteer firemen subscribing to this magazine to have any official standing in the Association and enjoy the numerous advantages of N.F.P.A. membership. Among the advantages of membership are the interesting *Quarterly* magazine containing authoritative reports on important fires as well as details of the latest developments in fire protection; the *Proceedings*, which gives a complete account of the N.F.P.A. annual meeting at which all current fire problems are discussed and at which the work of the many N.F.P.A. special committees are reviewed; the monthly *News-Letter* and many other pamphlets, posters and other valuable material. Under the present membership plan, which makes each volunteer company a member of the association, paying the $10 annual dues, each volunteer fireman has many of the advantages and privileges of N.F.P.A. membership through their company headquarters. Every volunteer fireman member owes it to himself to take advantage of the interesting N.F.P.A. material sent to his company. Likewise fire companies holding N.F.P.A. membership should realize that, as members, they are free to call upon the N.F.P.A. executive office for special assistance in fire problems.

Are Firemen's Tourneys Sufficiently Modern? Mr. Waldron Kintzing Post, for 25 years president and now honorary president of the Suffolk County Volunteer Firemen's Association of New York as well as former chief of the Bayport, L. I., Fire Department thinks that firemen's tourney contests should be made a real test of actual fire fighting conditions. He offers a plan which would modernize firemen's contests many of which, he states, are little more than automobile or foot races with apparatus. In brief, Mr. Post would limit the number of events by combining or eliminating obsolete contests. He would have less restriction as to the apparatus to be used so that each company can work out the problem presented with its own equipment. He believes that both time and expense would be saved by making the drills practical, that there would be less chance for infringements of the rules and that improvements in apparatus would result.

Homicide by Fireworks! Six persons including two children were killed and 12 others were seriously injured at Nampa, Idaho, on July 1, when a stock of fireworks on sale in a drug store were ignited by a piece of punk in the hands of a small boy. The fireworks stock was near the front exit of the crowded store and was only attended by boys. Most of those killed were in a balcony beauty shop which was almost instantly filled with hot flame and gases. Fire Chief Lessinger said it was the most rapid fire and most merciless extinction of human life he has ever seen in many years of experience. One woman was dead before she could get out of her chair. The only means of escape from the balcony was by jumping from a window to the concrete below. The intense heat melted plate glass windows and camera lenses.

Only four years ago an ordinance prohibiting the sale of fireworks in Nampa was repealed. Some persons, presumably merchants, went to the City Council demanding this repeal. Subsequently they forced amendments which nullified another ordinance which prohibited the discharge of fireworks in the business district. Even after this tragedy they forced withdrawal of an emergency fireworks prohibition ordered by the Mayor and City Council. The city authorities apparently did not realize that the innocent victims of the fireworks tragedy are just as dead as if shot by a gun, nor did they view profits from the sale of these fireworks as blood money.

Such tragedy has no deserved place in American Independence Day celebrations. Unfortunately what happened in Nampa might be duplicated throughout the United States during the first part of July. Write for a copy of the N.F.P.A. model fireworks ordinance and have it adopted and enforced in your town before the next holiday.

204 New Members and 420 Renewals Summer heat does not stop firemen from joining the Volunteer Firemen's Section as was shown by the enrollment of 10 departments with a total of 204 men during the past month. In addition, 20 companies with a total of 420 men renewed membership. The total for the section now stands at 553 departments with 12,328 men enrolled.

Castro Valley Fire Club, Hayward, California.

LaGrange Fire Department, LaGrange, Illinois.

Chevy Chase Fire Department, Chevy Chase, Maryland.

Dighton Fire Department, Dighton, Massachusetts.

Rochester Fire Department, Rochester, Michigan.

Clarkson Volunteer Fire Department, Clarkson, Nebraska.

Bainbridge Fire Department, Bainbridge, New York.

South Euclid Fire Department, South Euclid, Ohio.

Shenandoah Volunteer Fire Department, Shenandoah, Virginia.

Brooks Volunteer Fire Department, Brooks, Alberta.

Shuredry
SALVAGE COVERS

Reduce WATER DAMAGE and INSURANCE RATES

Three-fourths of all fire losses are directly chargeable to water damage. Reduce this hazard and better your record. Specify Shuredry Salvage Covers. Drill your men in their use. In every city where Shuredry Salvage covers are a part of regular equipment taxpayers have benefited.

Write our nearest plant for information and prices.

Fulton Bag & Cotton Mills
Manufacturers Since 1870
ATLANTA ST. LOUIS DALLAS
MINNEAPOLIS BROOKLYN NEW ORLEANS KANSAS CITY, KAN.

1 GALLON—DUPLEX PUMP
"CAPTAIN"-FYR-FYTER
AN IDEAL EXTINGUISHER FOR VOLUNTEER FIRE DEPARTMENTS

Here is the equivalent of four 1-quart extinguishers built into one thus making this large quantity of vaporizing liquid available without running for another extinguisher when more than the average size blaze is encountered. This is but one of the complete line of Fyr-Fyter Extinguishers each of which have exclusive merits which stamp them as superior.

DEALERS WANTED

If you are interested in adding to your income by spare time work or in building a permanent business for yourself without investment in stock, fixtures, etc., write for our new Dealer's Plan to

FYR-FYTER COMPANY
Dept. 20-20 DAYTON, OHIO

M·S·A

ALL-SERVICE GAS MASK
(BURRELL TYPE)

FINEST ALL-PURPOSE PROTECTION MONEY CAN BUY

The ONLY canister-type mask approved by the U. S. Bureau of Mines for protection against combinations of carbon monoxide and ALL other toxic industrial gases, smoke and fumes. The M. S. A. All-Service Gas Mask is used by more fire departments than any other mask; it is absolutely unequalled in its comfort, ease of adjustment and non-interference with breathing, seeing, hearing and working freedom.

• When equipped with the M. S. A. Speaking Diaphragm (as shown) transmission of speech is clear and resonant — permitting use of telephone or speaking-tube.

Write for new Bulletin, and ask us for a practical demonstration.

MINE SAFETY APPLIANCES CO.
Braddock, Thomas & Meade Streets
Pittsburgh, Pa.

District Representatives In Principal Cities

Membership Plan

Volunteer Firemen's Section, National Fire Protection Association

INDIVIDUAL membership in the National Fire Protection Association costs $10 per year. The membership plan for the Volunteer Firemen's Section is designed to give each fire company the advantages of N.F.P.A. membership. The fire company, as a member, receives at its headquarters a complete set of all regular N.F.P.A. literature, including the *Quarterly* magazine, as issued. In addition, as a special service to the Volunteer Firemen's Section, each fire company holding N.F.P.A. membership is entitled to have copies of the magazine VOLUNTEER FIREMEN sent to the home addresses of 20 firemen each month. If more than 20 firemen want to receive the magazine, an additional 50 cents should be sent in with the membership fee for each fireman in excess of 20 listed on the application blank.

Perhaps the simplest way to finance membership is to vote the annual dues from the company treasury. Other departments not wishing to take the money out of their treasury collect 50 cents from each man who is to receive VOLUNTEER FIREMEN until at least the minimum company membership fee of $10 is reached.

COMPANIES having less than 20 members frequently find outsiders who are interested and will pay 50 cents, or each fireman may put in a little more to make up the $10 for the company. In some cases a civic organization interested in the fire department may be willing to contribute all or a part of the dues so that the department may receive the advantages of belonging to the N.F.P.A. The N.F.P.A. does not specify which of the above methods may be used in financing membership. Just send in the annual dues with the names and addresses of the firemen who are to receive VOLUNTEER FIREMEN.

A New Forest Fire Poster

Million Copies of Striking Design by James Montgomery Flagg to Be Distributed by Forest Service—Original Will Hang in White House

FRESH impetus has been given to the battle against forest fires by a striking new forest fire prevention poster painted by the eminent artist James Montgomery Flagg. Much of the credit for this poster is due to Mr. Roy Headley, Chairman of the N. F. P. A. Forest Committee and Assistant Forester of United States Forest Service, who secured the services of the artist. The poster, which shows Uncle Sam in the field uniform of the United States Forest Service leading a fight against a forest fire toward which he points, is entitled "Your Forests—Your Fault—Your Loss!" A million copies are to be distributed throughout the United States this summer by the Forest Service.

President Roosevelt is shown accepting on behalf of the United States a striking forest fire poster by James Montgomery Flagg, the noted artist who painted the famous war-time poster "I Want You." Standing beside Mr. Flagg, who is nearest the picture, are Secretary of Agriculture Wallace and Associate Forester Clapp of the U. S. Forest Service.

The painting was accepted for the nation by President Roosevelt who was so impressed that he insisted that the White House be the perpetual home of the original. Twenty years ago President Wilson ordered the original of Mr. Flagg's war-time poster, "I Want You," considered the greatest war poster of all time, to be hung in the Smithsonian Institution in Washington, D. C.

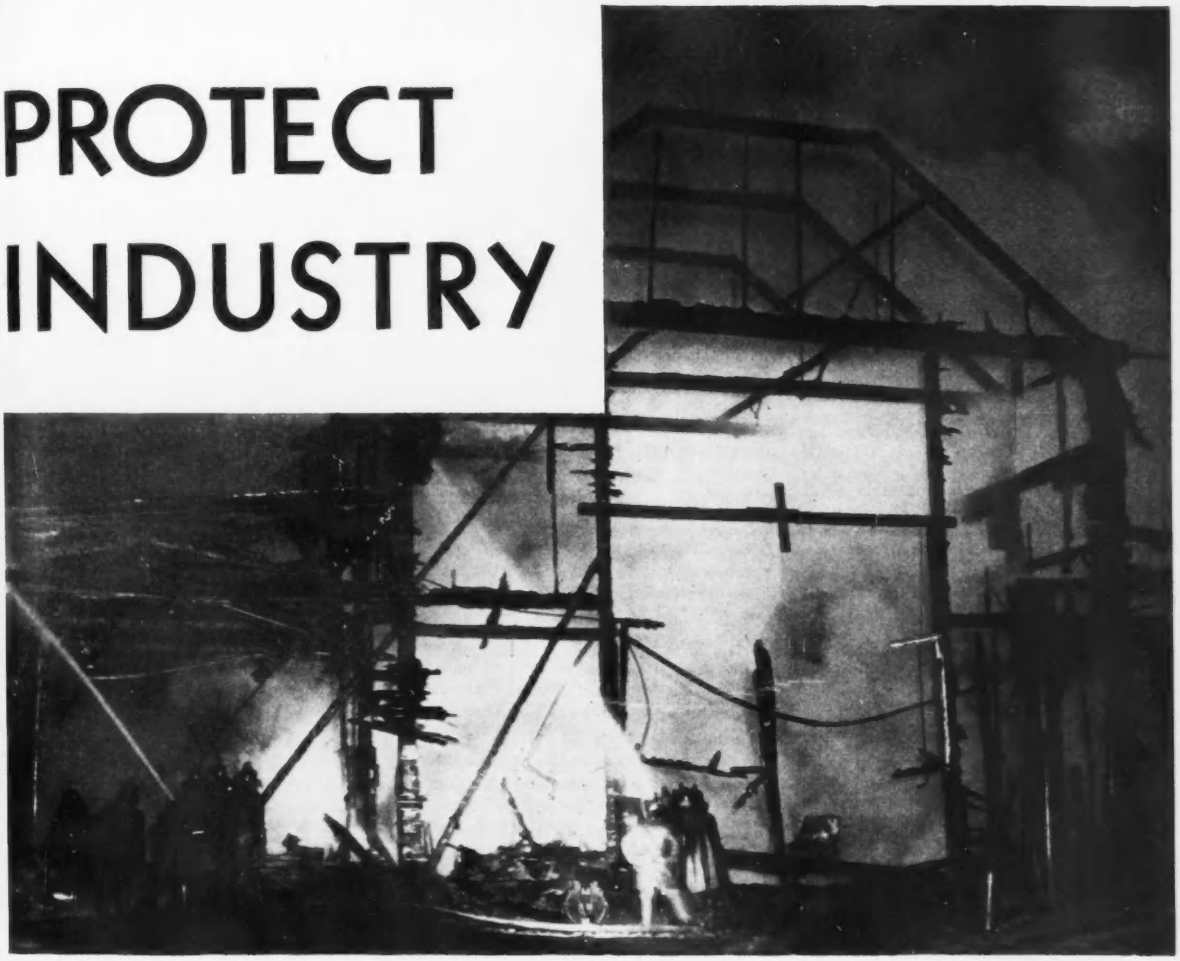
In accepting the painting Mr. Roosevelt said: "More than 30 years ago Theodore Roosevelt began a great battle which I have been proud to renew, the battle to conserve and rebuild our natural resources. America's forests are at last getting the care and the opportunity for renewal which they demand and which we depend upon. But the great enemy of our forests now is fire—fire that is started, nine times out of ten, by the carelessness of man. Carelessness can be prevented, and it is to that end that James Montgomery Flagg has painted and presented to the nation this vivid picture."

On leaving the White House Mr. Flagg told newspaper men: "Those of us who spend our lives trying to interpret the magic of the world in which we live probably find no greater horror anywhere than in the thought of forest fires turning the great beauty of the forests into flame. We see wild creatures of the woods as well as flowers destroyed, lands left more barren than remnants of a shell torn battlefield, and with it all the trees which would build homes for people turned into smoke and charcoal.

"Ever since the war, when I found it possible to serve my country with my paints and brushes, I have thought of other great national emergencies which could be depicted in pictures to tell their story as the Chinese say 'better than 10,000 words.' Naturally, forest fires have been one of the most important of these and I shall be most happy to have given of my thought and time if it will help more persons to become aware of the great and serious need which exists to control and reduce forest fires so that we and our children may enjoy the untarnished beauty of our forests, mountains, lakes and streams. I take pleasure therefore in presenting this painting through the President to the Forest Service for the people of the United States."

The original painting is now on a nation-wide tour which will require three months before the picture returns to its permanent home in the White House. The first place where the picture was displayed was in the concourse of the Grand Central Terminal in New York City. Volunteer firemen who are fortunate enough to see the original of the remarkable painting will want to secure a souvenir copy. While the President is going to have the original at the White House, the N.F.P.A. has been fortunate in obtaining a supply of these very attractive posters which are reproduced in four colors. Any volunteer firemen who are interested may obtain copies from the N.F.P.A., 60 Batterymarch St., Boston, Mass., while the supply lasts. Readers are also reminded that the N.F.P.A. Forest Committee also develops detailed recommendations covering various phases of forest fire control. Previously issued pamphlets are entitled, "Community Forest Fire Fighting Equipment" (10c), and "Fire Protection and Prevention for Summer Homes in Forested Areas" (10c). Single copies free to N.F.P.A. members.

PROTECT INDUSTRY



PROPERTY CREATED BY YEARS OF INDUSTRY IS DESTROYED BY FIRE IN AN HOUR as the result of only a slight delay in sending an alarm.

Fire is the greatest destroyer of property, and—*delay* due to inadequate facilities for transmitting alarms to the fire department is the greatest accelerator of the flames.

A reliable Fire Alarm Telegraph System with adequate box distribution protects property, gives the fire department a chance to keep losses small, and relieves the community as a whole from the responsibility for fire waste due to *Delayed Alarms.*

Surveys, plans and estimates furnished without cost or obligation.

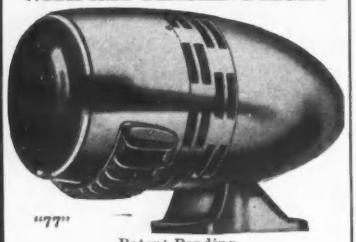
The Three-Fold Fire Alarm Box

"A Box a Block" in congested high value districts; not more than 500 feet to the nearest box in closely built residential districts; convenient to every group of buildings, manufacturing establishments, and institutions in sparsely built districts is generally a safe rule to follow.

THE GAMEWELL COMPANY

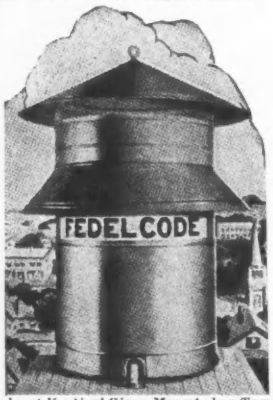
NEWTON UPPER FALLS MASSACHUSETTS

Specify
FEDERAL "77"
DOUBLETONE,
LONG ROLL SIREN
WITH RED FLASHING LIGHT



Patent Pending

Here is a siren with two distinct tones—a high, piercing tone to penetrate closed cars with a shriek for instant action—and a low, carrying tone that clears traffic for blocks ahead. To add to the carrying power, the frequencies of the two tones cross at regular intervals to produce an extra weighted beat that rolls ahead like the third wave at the seashore. You get two tones and triple power! And combined with this are the features of our famous C-5 Coaster Siren—the brilliant red or green flashing light beam, enabling traffic to both SEE and HEAR your warning—long roll of more than TWO MINUTES after current is shut off—grease sealed ball bearing motor — all-chrome finish. Write for New Bulletin No. 56 for complete details.



Federal Vertical Siren Mounted on Tower. Approved by the National Board of Fire Underwriters.

Federal VERTICAL Sirens are most practical because

(1) They distribute sound in a wide range in all directions.
(2) Rugged in construction to withstand all kinds of abuse.
(3) Entirely weatherproof housing finished in Red Duco withstands sleet, rain, hail and dust storms.
(4) They are equipped with special high speed, ball bearing Federal Siren motors.

Write for Bulletin No. 55 for complete details.

FEDERAL ELECTRIC CO.
8717 So. State St. Chicago, Ill.

Here's $10.00 Easy Money

Pyrene Prize Letter Contest Pays for Letters Telling of Fires Put Out With Fire Extinguishers

NO MAN can tell a story better than one who has had a personal experience. That is why Fire Chief Fred Conrad of Hammond, La., was able to carry off first honors in the Pyrene Prize Letter Contest this month. Chief Hammond wrote to us just three days after the life of his own son had been saved with a fire extinguisher. Other firemen also like the contest because their actual experience in using fire extinguishers brings them cash prizes. Prizes in the contest which is conducted jointly by the Pyrene Manufacturing Company of Newark, N. J., and VOLUNTEER FIREMEN are awarded on the basis of the actual fire fighting experience with fire extinguishers. The contest is not limited to fires controlled with 1-quart carbon tetrachloride extinguishers. Accounts of good work done with soda-acid, foam, or other approved types have won many prizes. If you have recently made a good stop with a fire extinguisher write us about it. Firemen in over three-fourths of the states in the United States have received cash awards in this contest. Canada has also received a good share of the money honors. You can win a cash prize.

FIRST PRIZE — $10.00

FRED CONRAD, *Chief,*

Fire Department, Hammond, La.

Extinguisher Saves Chief's Son

"On June 29, 1937 an alarm came in from the city garage and machine shop. On arrival we found that employees had been welding an old truck frame and a can of gasoline had been mistaken for a can of water by a 16 year old helper. His clothing was covered with gasoline which ignited. A member of our department happened to be present when this took place. He grabbed a 2½-gallon foam extinguisher and turned it on the boy saving his life. (This boy turned out to be my own son!)"

SECOND PRIZE — $3.00

L. R. FREYGANG, *Hoseman,*

Fire Department, Hood River, Oregon

Gasoline Fire Killed

"Several years ago I had a load of six drums of gasoline on a truck when a hot wire from the battery melted a gasoline tank connection causing a fire. I had just filled the tank with 21 gallons of gasoline. In the truck were two 1-quart carbon tetra-chloride extinguishers. With these two we put the fire out and saved the load of gasoline, the oil company's plant and the truck. The damage was only $3.50 for soldering the tank on the truck and 40 cents for paint."

THIRD PRIZE — $2.00

WALTER R. EAKINS,

Fire Company No. 1, Windber, Pa.

Saves Dry Cleaning Plant

"Two weeks ago, we responded to an alarm from a dry cleaning establishment located in the heart of the business section. A leak had developed in the gasoline line leading from a tank to the pressing machine. Heat from a nearby stove had caused the gasoline to ignite, setting the floor and wall afire. Prompt action with two 2½-gallon foam extinguishers, brought the fire under control with a minimum of damage."

CONTEST RULES

1. Contestants in the Pyrene Prize Letter Contest must be members of their local fire department.
2. Letters are to describe actual experiences where any approved fire extinguisher of any make has saved lives or property.
3. Trade names may be used but will be deleted in publication. Publishers reserve the right to edit winning letters to permit publication.
4. Each contestant automatically vouches for the truth of the facts presented from his own or others' experience.
5. Only one letter may be submitted each month.
6. Letters must be legibly written in ink or typewritten on white paper, one side only. Preference will be given to letters not over 250 words in length.
7. Letters received after the 8th of the month will be judged in following month's competition.
8. Monthly prizes in cash will be: 1st, $10.00; 2nd, $3.00; and 3rd, $2.00.
9. Address contest letters to Pyrene Prize Letter Contest, National Fire Protection Association, 60 Batterymarch St., Boston, Mass.

Advt.

Saved Double Its Cost On ONE Fire Fought Against Terrific Odds

Champion Efficiency Ably Demonstrated by Chief Johnson and His Men

The Fire Fighting forces of Oregon, Ill. include two pieces of fire apparatus, manned by the Chief and 25 Volunteers. Equipment and personnel are second to none—ready for instant action no matter how difficult, dangerous and arduous the duty.

This well organized fire department protects the City of Oregon and the surrounding countryside, including fine estates, country homes, and prosperous farms. All calls outside the city limits, including calls from non-subscribers, are speedily answered by Chief Johnson and his men with their Champion Fire Apparatus. The Champion, specially designed for rural fire fighting, was placed in service last year, and was purchased by the Fire Department with funds collected from subscribers for fire protection service.

When the time arrived to select their new piece of Apparatus the Oregon Fire Department went into the matter very thoroughly for they demanded the most modern type of Fire Apparatus, specially designed for country fire fighting and also suitable for service in town, dependable under severe operating conditions, and FULL VALUE FOR THEIR MONEY.

Specifications were drawn up. Bids taken. Almost a dozen Fire Apparatus concerns besieged the town for the business. Salesmen came and went. They talked, they promised, they said more than their prayers. One of our men drove to Oregon, which is only 80 miles distant, to answer misrepresentations made by some overly enthusiastic salesmen who thought more of their 25% commission than they did of the truth.

Chief Johnson and a committee visited our modern factory in Chicago. They stayed all day, examining apparatus in various stages of construction, inspecting parts and materials, watching tests of pumps and complete apparatus.

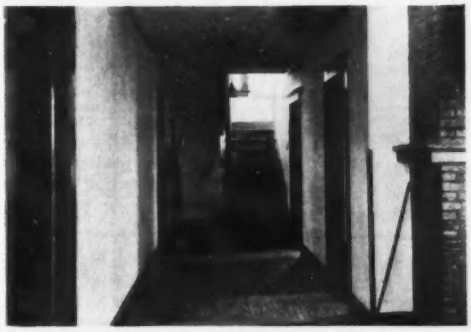
The Oregon Department sent men to visit several other Departments where Champions are in service. Chiefs and firemen who know Champion performance and dependability from experience related their stories to the Oregon men.

Finally, after due deliberation and discussion, the Oregon Department voted to buy a Champion, not because Darley was low bidder but because they realized that Champion is better apparatus than trucks costing much more.

Their sound and discerning judgment has been proved over and over again since the Champion has been in service. But never more forcefully and convincingly than when they saved a country home after an amazing fight against a fire apparently beyond control.

The fast, easy to handle Champion sped from its station in Oregon on this country call. In a few minutes it was on the scene with two high pressure booster streams attacking the rapidly spreading fire. But let's read the story of this astounding fire fighting performance as related in Chief Johnson's letter reprinted below.

Showing how badly dwelling was involved; roof gone, ceiling fallen. But the home was saved by good fire fighters using two booster streams.



First floor view showing very slight water damage to ceiling. Excellent firemanship!

OREGON FIRE DEPT.
Oregon, Illinois

W. S. Darley & Co.
Chicago, Ill.

April 3, 1937

Gentlemen:

I regret very much that I was unable to find time to call at your office last week, for it would have been easier to have given a picture of our first fire and our success in saving the dwelling with our new Champion truck.

Although our truck was delivered last fall, we had our first real country fire on Sunday morning, March 14th.

The alarm went about 9 o'clock in the morning just as I was sitting down to breakfast. I immediately drove to the fire which was at the Nellie Williams farm about 3 miles southeast of Oregon. When I turned in the lane the fire had gone through the roof and flames were 10 to 15 feet above the house. Arriving before the truck, I had time to make a survey of the building and locate the water tank which held approximately 500 gallons of water. I found that the entire upstairs was involved, part of the roof having fallen, as evidenced by pictures submitted. Because of the headway of the flames, I ordered the use of our booster tank and ran one booster line inside the house and one to the roof, organizing a bucket brigade to carry the water from the tank to the truck, rather than waste time laying a suction line. I WOULD SAY THAT WE HAD WATER ON THE FIRE IN LESS THAN 30 SECONDS AFTER THE TRUCK STOPPED ROLLING. Our good friend Fuzzy Grimes presided at the pump.

The boys did a wonderful piece of work as they always do. It was 10 minutes before we knew we would have a chance to save the house. Two good neighbors, when they saw that we were going to win, hastened to haul in water to us in milk cans which arrived at the exact moment we needed it to hold the gain we had made.

We saved the house as you can see by the pictures, the damage to the downstairs being practically nil, with less than 1,400 gallons of water and with a loss to the building of less than $1,250. It must be borne in mind that this was a fine country home, 7 rooms and completely modern.

The neighbors were amazed beyond expression that we were able to save the home and it is still the talk of the countryside.

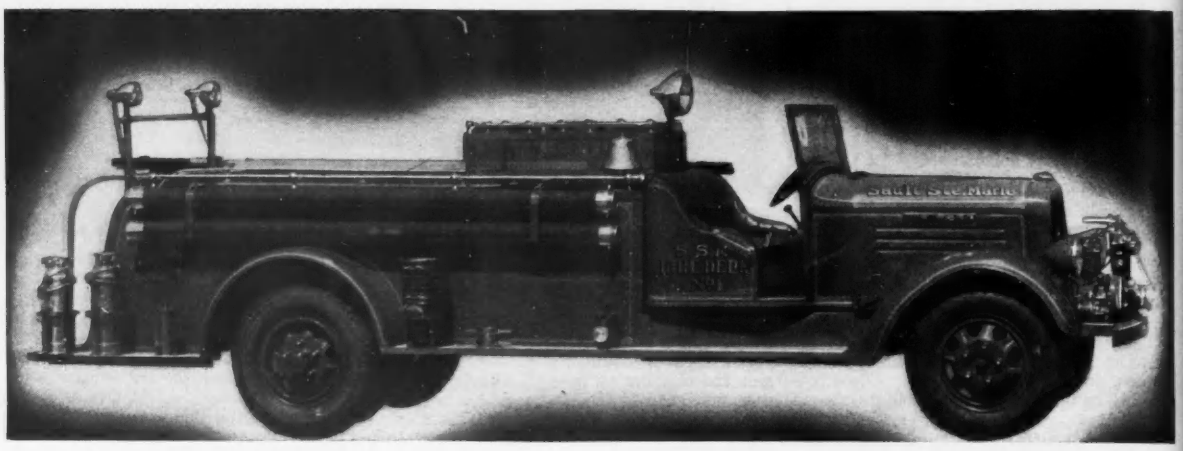
We repeated again last Friday night on a call at midnight and we saved a granary on a farm which had been ignited by a brooder house. Had the granary gone the dwelling would have no doubt been lost because a high wind was carrying the flames directly toward the dwelling.

Our Department has proved, I am sure, the value of Rural Fire Protection and the use of Champion Fire Apparatus especially designed for this work.

I am sure this report on the use of your equipment will interest you.

Very truly yours,
OREGON FIRE DEPT.
Paul O. Johnson, Chief

BARTON FIRE PUMPS



CENTRIFUGAL TYPE - - - - FRONT-MOUNTED

Marvelous Performance at LOW COST!

Barton Fire Pumps are recognized the world over as the best and most economical answer to the majority of fire protection problems.

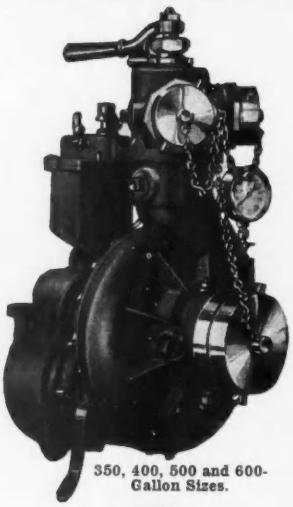
Unlike rotary and piston types, a modern Barton Centrifugal Pump has NO PARTS SUBJECT TO DAMAGE OR EXCESSIVE WEAR when pumping the dirtiest water.

Thus with a Barton you are not limited to pumping from city hydrants. In fact, every day Barton Pumps—automatically primed—are called upon to fight country and suburban fires, delivering huge volumes of water at smashing pressures from ponds, cisterns, rivers, etc.

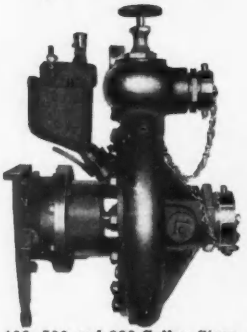
Any Barton Pump can be completely installed on a standard truck WITHOUT A SINGLE CHASSIS CHANGE. A good mechanic can do the entire mounting job in a few hours—entire expense but a few dollars.

New Edition (No. 4) of Bulletin 75
Contains Valuable Fire Stream Data

Write for your copy today! Learn about these wonderful Barton Pumps—how you can effect BIG SAVINGS and still have the finest pumping equipment. And, besides, our copyrighted Fire Stream Data will be found very useful.



350, 400, 500 and 600-Gallon Sizes.



400, 500 and 600-Gallon Sizes.

U-TYPE PUMPS

with Built-in-Gear-Drive for High Pressures at LOW Motor Speeds

This is the Barton DeLuxe Line —"World's Finest Front-Mounted Fire Pumps." All sizes Underwriters' tested. All ratings based on pumping from suction. When pumping from hydrant, every size delivers far in excess of its rating. Built-in Gear-Drive means that truck motor operates at approximately one-half pump speed. With a U-Type Barton Pump wide open, THE MOTOR LOAFS ALONG UNDER NO STRAIN.

F-TYPE PUMPS

with Direct-Drive

These three Barton Fire Pumps—also Underwriters' tested — have every feature offered by the U-Type Pumps, except the Gear-Drive. They are Direct-Drive Pumps, operating at direct motor speeds. This construction makes for lower cost. In fact, for the capacities they deliver, the F-type Pumps sell at the very lowest prices on record.

And we also build smaller fire pumps for booster service at even lower prices—ask us about them!

AMERICAN STEAM PUMP COMPANY

BATTLE CREEK, MICHIGAN . . *PUMPS AND PUMPS ONLY SINCE 1873*

PRINTED IN U. S. A.